

Date: Fri, 8 Oct 93 04:30:19 PDT
From: Ham-Ant Mailing List and Newsgroup <ham-ant@ucsd.edu>
Errors-To: Ham-Ant-Errors@UCSD.Edu
Reply-To: Ham-Ant@UCSD.Edu
Precedence: Bulk
Subject: Ham-Ant Digest V93 #71
To: Ham-Ant

Ham-Ant Digest Fri, 8 Oct 93 Volume 93 : Issue 71

Today's Topics:

 Antenna Analysis Programs
 Bilal Isotron Antennas (2 msgs)
 Directional 50MHz Antenna for radio phone?
 How can make the best Antena?
 Hy-Gain HF Vertical Manual Needed
 RF Guidance ???

Yagi.c - a simple C program to compute element lengths and spacings for yagi antennas

Send Replies or notes for publication to: <Ham-Ant@UCSD.Edu>
Send subscription requests to: <Ham-Ant-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Ant Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-ant".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: Thu, 7 Oct 93 02:33:21 GMT
From: nevada.edu!jimi!bob@uunet.uu.net
Subject: Antenna Analysis Programs
To: ham-ant@ucsd.edu

I was approached by a pair of fellow hams seeking my advice on which
of two programs to purchase. The programs were AO 6.0 by K6STI and
ELNEC by W7EL. I am a ladder-line and dipole type who has never had
any occasion to use a subset of NEC. Since I read this news group and
neither of the other hams have access to the internet I offered to
post this query. What are the strengths and weaknesses of these
programs. What are your experiences. What would you advise them.

Bob Maichle - K7SN

bob@cs.unlv.edu

Date: Thu, 7 Oct 1993 13:36:26 GMT
From: csus.edu!netcom.com!greg@decwrl.dec.com
Subject: Bilal Isotron Antennas
To: ham-ant@ucsd.edu

In article <CEHp92.9pp@srigenprp.sr.hp.com> alanb@sr.hp.com (Alan Bloom) writes:
>Alan Bloom (alanb@sr.hp.com) wrote:
>
>By the way, don't confuse the Isotron with the AEA Isopole, a perfectly
>good two meter vertical antenna.

...or with the AEA Iso-loop, which also does a very creditable job.

Greg

Date: Wed, 6 Oct 1993 19:10:14 GMT
From: dog.ee.lbl.gov!agate!howland.reston.ans.net!vixen.cso.uiuc.edu!sdd.hp.com!
hpsc.it.sc.hp.com!news.dtc.hp.com!srigenprp!alanb@network.ucsd.edu
Subject: Bilal Isotron Antennas
To: ham-ant@ucsd.edu

Alan Bloom (alanb@sr.hp.com) wrote:
: Charles R. Hohenstein (Charles.R.Hohenstein.1@nd.edu) wrote:
: : Has anyone on the Net had any experience with Bilal Isotron Antennas? The
: : compactness of the designs appeals to me, especially in the case of those
: : bands for which dipoles would require a lot of space (e.g., 160 and 80
: : meters).

: I tried one on 80 meters one field day. I found I got better results
: by simply loading up the coax as a random-length vertical!

I should have said I got MUCH better results with the coax. The band
sounded really dead on the Isotron. All signals got a S-unit or two
louder with the random-length coax.

By the way, don't confuse the Isotron with the AEA Isopole, a perfectly
good two meter vertical antenna.

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Date: Wed, 06 Oct 93 14:32:39 GMT
From: csus.edu!netcom.com!netcomsv!bongo!skyld!jangus@decwrl.dec.com
Subject: Directional 50MHz Antenna for radio phone?
To: ham-ant@ucsd.edu

In article <1993Oct5.200715.16120@bbx.basis.com> dthomas@bbx.basis.com writes:

> Would it be possible to make a cordless phone that uses a roof antenna for
> superior range, legally? Part 15 does state that the antenna must be
> attached to the unit. So how about running the phone line and power up
> to the roof, and attaching a suitably weatherproofed cordless phone
> base unit to a small mast?
>
> Just a thought. Then again, maybe it wouldn't work so well inside some homes.
> ("Hang on a sec, Phil. I'm getting some static. Let me go outside.")

A friend of mine runs a small automotive transmission shop. He has a cordless phone. He clip leaded the base antenna to about 100 ft of wire wrapped around the interior of the shop. Now he can talk on the phone while test-driving the customers cars around the block.

Legal? I doubt it. Effective? Apparently so.

Amateur: WA6FWI@WA6FWI.#SOCA.CA.USA.NA	"It is difficult to imagine our
Internet: jangus@skyld.tele.com	universe run by a single omni-
US Mail: PO Box 4425 Carson, CA 90749	potent god. I see it more as a
Phone: 1 (310) 324-6080	badly run corporation."

Date: Thu, 7 Oct 1993 15:21:03 GMT
From: puc.cl!tolten.puc.cl!equero@uunet.uu.net
Subject: How can make the best Antena?
To: ham-ant@ucsd.edu

I 'am beginner, really inexperienced.
I have a ICON VHF transiver.
My operating frequency is 166300 (MHZ?)
How i make an easy antenna ?
The actual antenna is an helicoidal (is very small)
The power of transiver is 2.5 Watt.
My idea is put it (transiver) in my bedroom and antenna in my roof.
What is the maximum length of wire between transiver and antenna?
What kind of wire i use? (50 ohms?)

I know the form of antenna, but What kind of material i can use to construct it? What is the best? I hope it that not expensive.

Thank and sorry (my english is not good). Do you understand me?

THANKS THANKS EDuardo Quero B.
equero@tolten.puc.cl

Date: 7 Oct 93 22:21:25 GMT
From: ogicse!uwm.edu!cs.utexas.edu!geraldo.cc.utexas.edu!nuntius@network.ucsd.edu
Subject: Hy-Gain HF Vertical Manual Needed
To: ham-ant@ucsd.edu

My e-mail to you keeps bouncing.

Barry
W5KH
Barry Newberger, W5KH
Inst. for Fusion Studies, UT-Austin
Austin, TX 78712-1060
tel (512) 471-3726
fax (512) 471-6715

Date: 7 Oct 93 19:48:37 GMT
From: news-mail-gateway@ucsd.edu
Subject: RF Guidance ???
To: ham-ant@ucsd.edu

Hello Barrie

The best way to avoid hitting a RF reflector is to try and guide towards it :-). What you say is true, but the antennas need to be spaced far enough apart to detect the time difference of arrival. You don't state what frequency you are using and how far apart the antennas are. Generally what you are measuring is phase difference not time difference. You can find out more by getting a introductory radar book and reading about monopulse.

73, Erich KA6AMD @ WA6YBN.#SOCA.CA.USA.NA
Internet: muschinske%39a.decnet@scfb.chinalake.navy.mil

Date: 7 Oct 93 12:16:01 GMT

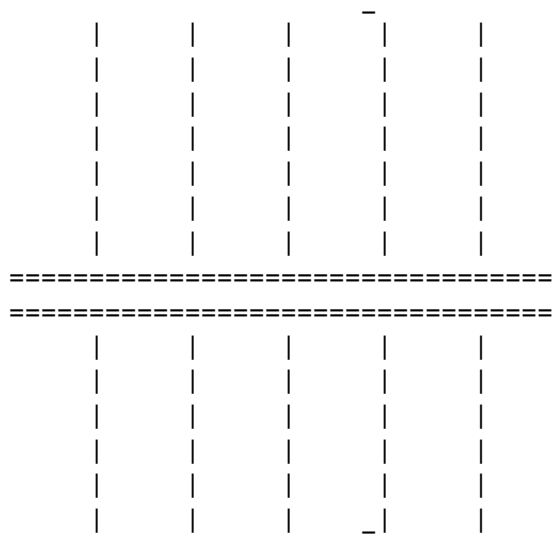
From: ogicse!uwm.edu!caen!nic.umass.edu!ymir.cs.umass.edu!heller@network.ucsd.edu

Subject: Yagi.c - a simple C program to compute element lengths and spacings for yagi antennas

To: ham-ant@ucsd.edu

This is a simple little C program for computing the dimensions for a yagi type VHF antenna. The program assumes that the antenna will be built using a 2x3 and 1/2" electrical conduit (metal). The only real tricky part would be the "bent up" ends of the driven element. This could be done with elbows. You will need to run wires from the ends of the driven element to the center beam (2x3). 12 gauge solid wire is good -- you can use a piece of type NM (romex) house wiring wire. (Stripping the insulation off is best, but leaving it on is ok, esp. if you don't have some way of keeping the wire off of the element.) A two-lug barrier strip mounted on the 2x3 provides a connection point for the down line (it is 300 ohm balanced at that point).

The antenna will look like this:



The "="s are the 2x3 (2" face visible), the "|"s are the elements. The element with the bends ("_") is the driven element. The element to the right of the driven element is the reflector and the others are the directors, smallest to largest in order from left to right. The signal is presumed to be coming from the left (shortest director points to signal source). The 5 element .8 wavelength antenna is shown -- the others are similar.

This program compiles and runs under CP/M-68K, but the C code is pretty generic, so it should compile with almost any C compiler. It is K&R C, not ANSI C, but that should be an easy fix. There are only two functions (main() and usage()) and it makes no system calls and only calls atof(), printf(), and a function named abort() (could be replaced with exit(-1)).

```
/* -*-c-mode-*-* ***** This is the first line of the program *****/
/*-----
 *   YAGI.C - program to compute dimensions for a Yagi antenna
 *   Robert Heller Tue Sep 25 08:27:43 1984
 *-----*/
#include <stdio.h> /* standard defs */
#define LOCAL static /* local storage */
#define FAST register /* fast variables */

/* only ONE of the following 5 lines should be UNcommented out */
/*#define L04 /* for 0.4 Wavelength antennas (3 elements, Gain = 7.1 dB) */
#define L08 /* for 0.8 Wavelength antennas (5 elements, Gain = 9.2 dB) */
/*#define L12 /* for 1.2 Wavelength antennas (6 elements, Gain = 10.2 dB) */
/*#define L22 /* for 2.2 Wavelength antennas (12 elements, Gain = 12.25 dB) */
/*#define L32 /* for 3.2 Wavelength antennas (17 elements, Gain = 13.4 dB) */
/*#define L42 /* for 4.2 Wavelength antennas (15 elements, Gain = 14.2 dB) */

/* now set up antenna size independent constants and data */

#define SpeedOfLight (299792500.0) /* speed of light, in Meters per Second */
#define Mhz (1000000.0) /* # cycles in a MegaHertz */
#define WaveLength(F) (SpeedOfLight / (F * Mhz)) /* macro to compute the
wavelength */
#define InchesPerMeter (39.37) /* number of inches in a meter */
#define Inches(M) (M * InchesPerMeter) /* macro to convert from meters to
inches */
#define LE (0.453) /* driven element length (straight part) */
#define ENDS (0.0235) /* length of "tails" of the driven element */

/* now set up antenna size dependent constants and data */

/* most of the reflector lengths are the same. the 4.2 wavelength ant. is
different */
#ifdef L42
#define LR (0.475)
#else
#define LR (0.482)
#endif

/* params for the 0.4 wavelength ant. */
```

```

#ifdef L04
#define NUMDIR 1 /* number of directors */
#define SP (0.2) /* director spacing */
#define GAIN (7.1) /* gain */
/* sizes of the directors */
LOCAL float LDS[1];
#endif

/* params for the 0.8 wavelength ant. */
#ifdef L08
#define NUMDIR 3 /* number of directors */
#define SP (0.2) /* director spacing */
#define GAIN (9.2) /* gain */
/* sizes of the directors */
LOCAL float LDS[3];
#endif

/* params for the 1.2 wavelength ant. */
#ifdef L12
#define NUMDIR 4 /* number of directors */
#define SP (0.25) /* director spacing */
#define GAIN (10.2) /* gain */
/* sizes of the directors */
LOCAL float LDS[4];
#endif

/* params for the 2.2 wavelength ant. */
#ifdef L22
#define NUMDIR 10 /* number of directors */
#define SP (0.2) /* director spacing */
#define GAIN (12.25) /* gain */
/* sizes of the directors */
LOCAL float LDS[10];
#endif

/* params for the 3.2 wavelength ant. */
#ifdef L32
#define NUMDIR 15 /* number of directors */
#define SP (0.2) /* director spacing */
#define GAIN (13.4) /* gain */
/* sizes of the directors */
LOCAL float LDS[15];
#endif

/* params for the 4.2 wavelength ant. */
#ifdef L42
#define NUMDIR 13 /* number of directors */
#define SP (0.308) /* director spacing */

```

```

#define GAIN (14.2)      /* gain */
/* sizes of the directors */
LOCAL float LDS[13];
#endif

main(argc,argv)
int argc; /* arg count */
char **argv; /* arg vector */
{float atof(); /* ASCII to floating point function */
  /* local variables:
    freq - frequency (in MHz.)
    wave - wavelength (in Meters)
    driver - length of driver (in meters)
    end - length of ends
    reflect - length of reflector
    spacing - director spacing
    boomlen - length of boom (distance from reflector to last
              driver)
    refsp - spacing from driven element to reflector
    lds - array of director lengths
    i - an index
  */
  FAST float freq,wave,driver,end,reflect,spacing;
  FAST float boomlen,refsp;
  LOCAL float lds[NUMDIR];
  FAST int i;

#ifdef L04
  LDS[0] = 0.424;
#endif
#ifdef L08
  LDS[0] = 0.428;
  LDS[1] = 0.424;
  LDS[2] = 0.428;
#endif
#ifdef L12
  LDS[0] = 0.428;
  LDS[1] = 0.420;
  LDS[2] = 0.420;
  LDS[3] = 0.428;
#endif
#ifdef L22
  LDS[0] = 0.432;
  LDS[1] = 0.415;
  LDS[2] = 0.407;
  LDS[3] = 0.398;
  LDS[4] = 0.390;

```



```

    LDS[5] = 0.390;
    LDS[6] = 0.390;
    LDS[7] = 0.390;
    LDS[8] = 0.398;
    LDS[9] = 0.407;
#endif
#ifdef L32
    LDS[0] = 0.428;
    LDS[1] = 0.420;
    LDS[2] = 0.407;
    LDS[3] = 0.398;
    LDS[4] = 0.394;
    LDS[5] = 0.390;
    LDS[6] = 0.386;
    LDS[7] = 0.386;
    LDS[8] = 0.386;
    LDS[9] = 0.386;
    LDS[10] = 0.386;
    LDS[11] = 0.386;
    LDS[12] = 0.386;
    LDS[13] = 0.386;
    LDS[14] = 0.386;
#endif
#ifdef L42
    LDS[0] = 0.424;
    LDS[1] = 0.424;
    LDS[2] = 0.420;
    LDS[3] = 0.407;
    LDS[4] = 0.403;
    LDS[5] = 0.398;
    LDS[6] = 0.394;
    LDS[7] = 0.390;
    LDS[8] = 0.390;
    LDS[9] = 0.390;
    LDS[10] = 0.390;
    LDS[11] = 0.390;
    LDS[12] = 0.390;
#endif

    if (argc != 2) usage(); /* argument count check */
    freq = atof(++argv); /* get frequency */
    wave = WaveLength(freq); /* compute wavelength */
    driver = wave * LE; /* compute length of driver */
    end = wave * ENDS; /* compute length of end pieces */
    reflect = wave * LR; /* length of reflector */
    for (i=0;i<NUMDIR;i++) lds[i] = wave * LDS[i]; /* length directors */
    spacing = wave * SP; /* director spacing */
    refsp = 0.2 * wave; /* reflector spacing */

```

```

    boomlen = (0.2 + (NUMDIR * SP)) * wave; /* boom length */
    /* now print all this good info out */
    printf(
"-----\n\n"
    );
    printf("Frequency = %5.1f MHz.\nWavelength %8.3f Meters (%8.3f Inches)\n",
        freq,wave,Inches(wave));
    printf(
"Boom length = %8.3f Meters (%8.3f Inches) (%2d elements)\nGain = %5.2f dB\n",
        boomlen,Inches(boomlen),NUMDIR+2,GAIN);
    printf("Driver element length = %8.3f Meters (%8.3f Inches)\n",
        driver,Inches(driver));
    printf("Driver end piece lengths = %8.3f Meters (%8.3f Inches)\n",
        end,Inches(end));
    printf("Reflector element length = %8.3f Meters (%8.3f Inches)\n",
        reflect,Inches(reflect));
    for (i=0;i<NUMDIR;i++)
        printf(
"Director # %2d element length = %8.3f Meters (%8.3f Inches)\n",
            i+1,lds[i],Inches(lds[i]));
    printf("Director spacing = %8.3f Meters (%8.3f Inches)\n",
        spacing,Inches(spacing));
    printf("Reflector to driver spacing = %8.3f Meters (%8.3f Inches)\n",
        refsp,Inches(refsp));
    printf(
"\n-----\n"
    );
}
/* usage message function */
usage()
{
    fprintf(stderr,
        "Usage: yagi frequency\n");
    abort(0);
}
/***** This is the last line of the program *****/

--
    /   InterNet: Heller@CS.UMass.EDU
Robert Heller |   BIX:      locks.hill.bbs
               |   FidoNet: 1:321/153 (Locks Hill BBS)
               \   CompuServe 71450,3432

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End of Ham-Ant Digest V93 #71
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